IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 10/611,522
Applicant: Robert J. Friday
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Title: Non-Overlapping Antenna Pattern Diversity in Wireless Network Environments

Docket No.: 6561/53768
Customer No.: 30505

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT D RESPONDING TO **FINAL OFFICE ACTION**
UNDER 37 C.F.R. 1.116

Sir:

In response to the Office Action mailed February 23, 2006, please amend the application as follows.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously amended) An apparatus for enhancing operation of wireless network environment, comprising

a plurality of directional antennas oriented about an axis, wherein the plurality of directional antennas have substantially non-overlapping patterns relative to each other, wherein the peak gains of the plurality of directional antennas are oriented radially and outwardly about the axis and offset relative to each other at an angle substantially equal to 360/N, where N is the number of directional antennas in the plurality of directional antennas; wherein the plurality of directional antennas are each operative to transduce a radio frequency signal and provide an output signal corresponding to the radio frequency signal;

a switch operatively connected to the plurality of antennas and operative to switch between the antennas in response to control signals;

a detector operative to detect at least one signal attribute of the output signals provided by the directional antennas; and

an antenna selection module operative, during receipt of the preamble of a wireless frame, to

provide control signals to the switch designating selected directional antennas in the plurality of directional antennas,

evaluate the respective output signals provided by the selected antennas, and

select a directional antenna from the plurality of directional antennas for receiving the radio frequency signal associated with the wireless frame.

2. (previously amended) The apparatus of claim 1 further comprising a radio module operatively connected to the switch for receiving output signals from one of the plurality of directional antennas selected by the antenna selection module.

3. (previously amended) The apparatus of claim 2 wherein the radio module is operative to demodulate the received output signals into digital data streams.

4. (original) The apparatus of claim 2 further comprising a data link control unit operative to process the digital data streams and identify frames from the digital data streams.

5. (previously amended) The apparatus of claim 4 wherein the antenna selection module is further operative to identify the selected directional antenna to the data link control unit, and wherein the identified frames include a source address, and wherein the data link control unit is operative to store the identified directional antenna in association with the source address in the frames in a data structure.

6. (original) The apparatus of claim 5 wherein the data link control unit is operative to

compose a frame for transmission to a destination,

retrieve the antenna identifier associated with the destination address in the data structure,

transmit control signals to the switch designating the retrieved antenna for use in transmitting the composed frame.

7. (original) The apparatus of claim 5 wherein the data link control unit is operative to transmit a frame acknowledging the received frame.

8. (previously amended) The apparatus of claim 7 wherein the acknowledging frame is transmitted using the directional antenna selected to receive the frame.

9. (previously amended) The apparatus of claim 1 wherein at least one directional antenna is a patch antenna.

10. (previously amended) The apparatus of claim 1 wherein at least one directional antenna is a yagi antenna.

11. (previously amended) The apparatus of claim 1 wherein at least one directional antenna is a parabolic antenna.

12. (previously amended) The apparatus of claim 1 wherein the plurality of directional antennas are configured to maximize the coverage area provided by the plurality of directional antennas.

13. (previously amended) The apparatus of claim 1 wherein the plurality of directional antennas are configured to provide radio frequency coverage in all directions.

14. (previously amended) The apparatus of claim 1 wherein the switch, in a listen mode, is operative to switch between the directional antennas before a wireless frame is detected.

15. (previously amended) In a wireless network system comprising a plurality of directional antennas oriented about an axis, wherein the plurality of directional antennas have substantially non-overlapping patterns relative to each other, and wherein the peak gains of the antennas are oriented radially and outwardly about the axis and offset relative to each other at an angle substantially equal to 360/N, where N is the number of directional antennas in the plurality of directional antennas, a method comprising

detecting a signal transduced by one of the directional antennas, wherein the signal transmits a wireless frame, the wireless frame including a preamble;

during receipt of the preamble of the frame, selecting one from the plurality of the directional antennas based on at least one attribute of the respective signals transduced by the antennas;

switching to the selected directional antenna for receipt of the remainder of the frame.

16. (original) The method of claim 15 further comprising

demodulating the signal to provide a digital data stream,

recovering a data packet from the digital data stream.

17. (previously amended) The method of claim 16 further comprising

transmitting an acknowledgement frame using the selected directional antenna.

18. (original) The method of claim 15 wherein the signal is a frequency-division multiplexed signal.

19. (original) The method of claim 15 wherein the signal is an orthogonal frequency-division multiplexed signal.

20. (previously amended) An apparatus for enhancing operation of wireless network environment, comprising

a plurality of directional antennas oriented about an axis, wherein the plurality of directional antennas have substantially non-overlapping patterns relative to each other, and wherein the peak gains of the plurality of antennas are oriented radially and outwardly about the axis and offset relative to each other at an angle substantially equal to 360/N, where N is the number of directional antennas in the plurality of directional antennas;

a switch operatively connected to the plurality of antennas and operative to switch between the antennas in response to control signals;

a detector operative to detect at least one signal attribute of the signals transduced the antennas; and

an antenna selection module operative, during receipt of the preamble of a wireless frame, to

provide control signals to the switch designating a selected antenna,

evaluate signal attributes provided by the detector,

select an antenna from the plurality of antennas for receiving the signal associated with the wireless frame; and

an orthogonal frequency division multiplexed (OFDM) module operative to

receive the signal from the switch,

and recover a digital data stream from the signal.